The Analysis of Pluralistic Ignorance of Married Men in Saudi Arabia on Women Working Outside of Home (WWOH)[1]

Tracy Yang Alex Sun

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Abstract First sentence. Second sentence. Third sentence. Fourth sentence.

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[1]Code and data are available at: https://github.com/YcartXin/Analysis-of-Men-in-Saudi-Arabia-on-WWOH; Reproduction DOI: https://doi.org/10.48152/ssrp-1wa4-dk30

1 Introduction

In the landscape marked by rapid socio-economic transformations, Saudi Arabia continues to grapple with the enduring issue of gender inequality, manifesting in various forms of discrimination and unbalanced treatments towards women. In spite of recent reforms targeted at enhancing women's rights, such as allowing women to drive and easing guardianship laws, challenges continue to persist in employment opportunities, legal rights, and societal expectations. This system is deeply rooted in cultural norms and a conservative interpretation of Islamic law, which collectively hinder women's participation in society and public life.

With the constantly changing political landscape of Saudi Arabia, it is essential to consider sentiment in regards to the increasing presence of women in society. While it is known that Saudi Arabia and many other middle-eastern countries fall behind progressive nations in terms of legal women rights, there is a void of information in regards to whether the social sentiment is changing. Bursztyn, Gonzalez, and Yanagizawa-Drott directly address this issue by investigating the opinions of married men in Saudi Arabia [1].

Pluralistic ignorance describes the misalignment between private and public beliefs XX. In the context of the paper by Bursztyn et.al. (2020), it illustrates the discrepancy between an individual's private support for women working outside the home (WWOH) and their belief of public opposition. The above authors' findings suggest that the vast majority of married men aged 18-35 underestimate societal support for female employment, despite private beliefs that align more with progressive values. This gap between private attitudes and perceived social expectations highlights the need for interventions that accurately communicate societal beliefs to bridge the divide [1].

This paper will reproduce Bursztyn, Gonzalez, and Yanagizawa-Drott's findings, while applying a demographic focused lens to establish if certain variables such as age or education have a bearing on support for WWOH. In particular, our paper will replicate the following three research claims:

- The vast majority of married men in Saudi Arabia privately support WWOH
- The married men massively underestimate the level of support from other men in their communities
- Correcting these beliefs about others' feelings will affect the outcome of whether the married man's wife work.

For this paper, our estimand is the difference between the married men's guess on how many people in their survey group support WWOH and the actual percentage of people in their group that support WWOH. The remainder of this paper is structured as follows. We will first describe our data sources in Section 2 (Data), followed by a description of the variables and methodologies utilized by the original paper in Section 3 (Results). We will then conduct a reproduction of certain figures and results to verify the original paper's findings in the same section. Afterwards, we will summarize our results when compared to the original paper. We will additionally conduct an in-depth examination of how various demographics affect the support for WWOH. Lastly, in Section 4 (Discussion), we will discuss the findings from Section 3 (Results) in context.

2 Data

2.1 Data source

This analysis will be carried out in **R** [2] using packages **tidyverse** [3], **dplyr** [4], **ggplot2** [5], **knitr** [6], **here** [7]. The paper was published in the American Economic Review 2020, 110(10) issue between pages 2997-3029 [1]. The data was similarly uploaded at the same time and has not been updated since. There are two data sets out of others collected in the original research that this paper will utilize.

There are four data sets used in this paper. 1. "1st Online Survey Clean", 2. "2nd Online Survy Clean", 3. "Main Experiment Clean", and 4. "Follow Up Clean". The all four data sets are sourced from the replication package provided by Bursztyn et.al (2020) as they collected all the data in their research. The collection processes will be further explained in the following subsection.

2.2 Measurement and collection

"1st Online Survey Clean" will only be used to conduct analysis on the support of married Saudi Arabian men on women working outside of home. Therefore, its selection process is not extremely extensive. The qualifying characteristics are marriage status (married) and age (18-35). This survey was conducted nationally and anonymously. This imported data contains 1460 observations and 21 variables. However, the other aspects of this survey is not further discussed as the data will not be used in this paper.

Another data set used in our paper is the "Second Online Survey." This survey was very similar to the first, targeted towards married men in Saudi Arabia. The survey contained 703 participants, all of whom were married 18-45 year olds and 20 variables. The researchers decided to increase the upper-bound in the hopes of reaching a larger sample. The survey was conducted from January to February 2020 and participants responded anonymously online. From this data set, the only relevant variable for our analysis will be the "discuss_freq" variable, which indicates how often married men talk about WWOH with their friends and colleagues.

However, the main experiment data "Main Experiment Clean" needs a more extensive examination. The sampling for the experiment was conducted through a partnership between a local branch of an international survey company and Bursztyn et.al. They recruited 500 Saudi Arabia men between the ages of 18 and 35, living across Riyadh, Saudi Arabia [1]. The requirement for the men to sampled includes being married, having a cell phone (for easy reach and communication), and having minimum some kind of college education [1]. All qualifying subjects were invited to a hotel to conduct the experiment portion in-person. The men were separated into groups of 30 with the average participant knowing 15 out of the 29 of other participants [1]. They were then surveyed on WWOH and whether they would support their wives working outside of home. The research team then reveals the opinions of other participants in the room and distributes another survey on whether the participants would support their wives working outside of home.

Even though the data imported has already been cleaned, it is not in the state that can be directly used in this paper. The cleaning process will keep XX as they are relevant to replicate the targeted aspects and the following analysis. Additionally, the main experiment's raw data's sampling

methodology also contains flaws. There is incongruity between what the paper claims the data to be and what the data shows. For example, although the experiment claims to have only recruited men who are married, the data shows otherwise and thus some data points will be further removed from the analysis. The participants' highest education also ranges from a secondary degree to a doctorate degree even though the original paper claims that they sampled men with lowest college degree [1]. The secondary degree participants, however, will not be removed from the data set as they do not affect the purpose of the analysis, and further investigation on the effect of education on the support of WWOH will be conducted in Section 3. The sample of 500 men with some removed due to empty data points and others due to attribute qualifications is quite small to be very representative of the male population in Saudi Arabia. The cleaned data will be further explored in Section 2.3.

Lastly, the data set "Follow Up Clean" is information from the follow up survey that was conducted on the same sample as the main experiment three months alter. This survey is a phone call and the variables that will be used is to examine the change in the participants' wifes' employment since the main experiment as well as whether the husband was in the treatment or control group. This data set contains 500 observations and 33 variables.

2.3 Exploring the data

After the data cleaning process, irrelevant variables were removed along with empty responses. The online survey data now consists of only one variable with 728 observations. The variable "c_outside_self" signifies whether the respondent supports women working outside of home. The follow up data now consists of 361 observations with three variables: "emply_prev", "emply_now", "condition2". The second main experiment data includes 702 observations and 1 variable as well, which is the frequency of discussion of WWOH issues.

For the cleaned main experiment data, irrelevant variables and empty responses were also deleted. It now consists of XX observations with XX variables. The variables are listed and explained below:

Table 1 shows what the cleaned data for the main experiment looks like.

Table 1: Sample of Cleaned Main Experiment Data of Saudi Arabian Men on WWOH

age	education	outside_self	condition2	employed_now	college_deg	children	outside_wedge	age_groups
24	5	1	0	1	0	2	3	2
20	3	1	1	1	0	2	−4	1
28	3	1	0	0	0	0	−1	2
18	3	1	0	1	0	1	−7	1
29	6	1	0	1	1	2	2	2

3 Results

3.1 Aanalysing origial paper

This section will try to affirm the findings in the original paper with the cleaned data. As stated in Section 1, the three main claims made by Bursztyn et.al are: + The vast majority of married men in Saudi Arabia privately support WWOH. + The married men massively underestimate the level of support from other men in their communities. + Correcting these beliefs about others' feelings will affect the outcome of whether the married man's wife work.

The first claim can be easily explored using the cleaned national online survey data with its variable on the participant's support of WWOH.

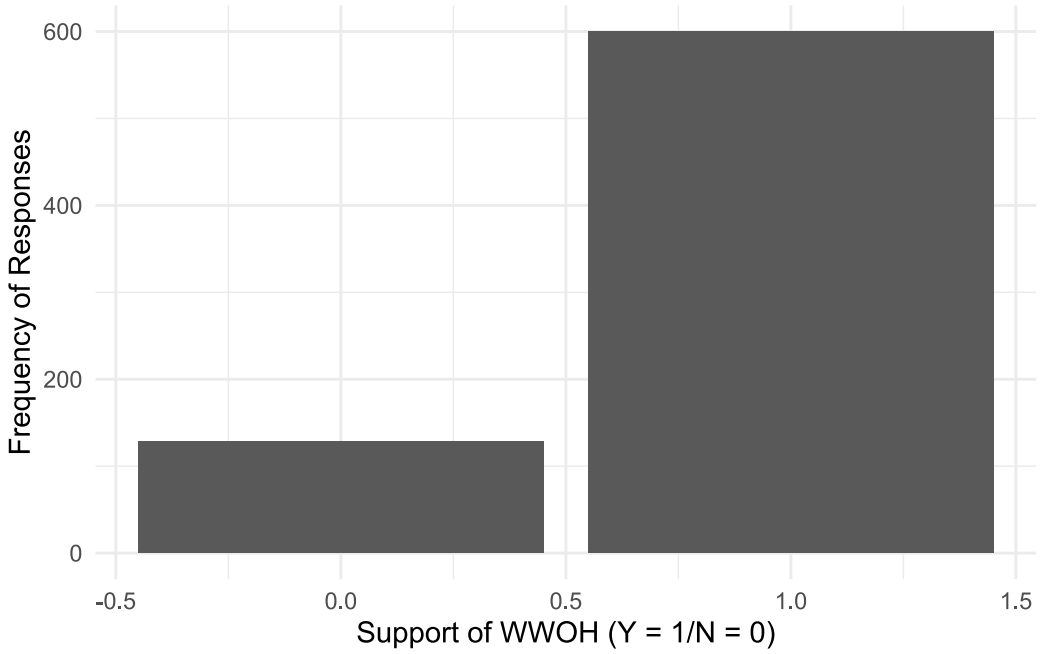


Figure 1: Support of Young Married Men in Saudi Arabia of WWOH

Figure 1 confirms that the majority of young married men in Saudi Arabia do support women working outside of home. Out of the 728 observations, around 600 chose in favour that "In my opinion, women should be allowed to work outside of the home" [1]. This signifies that the first claim is accurate.

Starting from the second claim, we will be using the main experiment data. Before manipulating it into graphs and tables, we can first understand the cleaned data better with summary statistics. The "condition2" variable separates the treatment and control groups.

Table 2: Summary Statistics on Men Who Participated in the Main Experiment

condition2	Observations	Age	Children	College(%	Employed(%)	group
0	240	24.71250	1.591667	55.41667	87.91667	Control
1	242	24.95455	1.768595	59.09091	88.01653	Treatment

Total	Age	Children	College	Employed(%)
482	24.83402	1.680498	57.26141	87.9668

As seen in Table 2 above, there are less than 500 data points present in the cleaned data. From these data points, we can test the claim that married men massively underestimate the level of support from other men in their communities. The surveys from the main experiment asked the participants about their predictions of how many others in the group of 30 (from 0 to 29) of many they know of, would support WWOH. The percentage difference between their beliefs and the actual calculated number is shown as wedges in Figure 2. This graph shows the distribution of the difference between beliefs on what percentage people support WWOH and actual percentage of people that support WWOH. The values were calculated as (participants guess about percent of session participants that agree with WWOH - the actual percentage of participants that agree with WWOH).

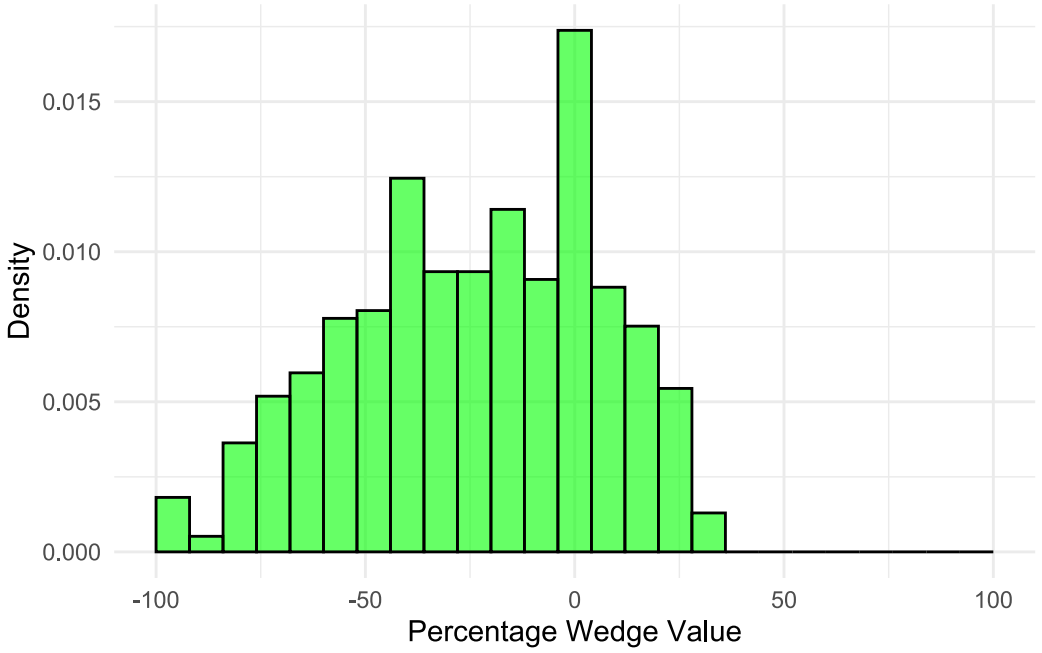


Figure 2: Density Histogram of Percentage Wedge on Difference Between Beliefs and Actual Calculation

In Figure 2, from assessing the distribution of these wedges throughout all sessions, the data revealed that a substantial majority (72%) of the participants consistently undervalue the level of

endorsement for WWOH within their session cohorts. On average, this wedge is observed to be a 24 percentage points difference, aligning very similarly with the conclusions drawn from the original paper [1]. Thus, the second claim of that married men massively underestimate the level of support from other men in their communities is further substantiated.

The last claim this replication paper is going to focus on is that correcting beliefs about others' feelings will affect the outcome of whether the married man's wife works. In the main experiment done by Bursztyn et.al, a follow up survey three months later records the difference in the participant's wife's employment difference [1]. As the men experienced learning about others' surprisingly supportive views on WWOH during the first survey, this three-month difference in wifes' employments maybe attributed to the correcting of beliefs. The difference is shown in Table 3 below.

Table 3: Employment Difference of Wives between Two Surveys Three Months Apart

(a): Treatment

emply_prev	emply_now	n
0	0	160
0	1	4
1	0	4
1	1	13

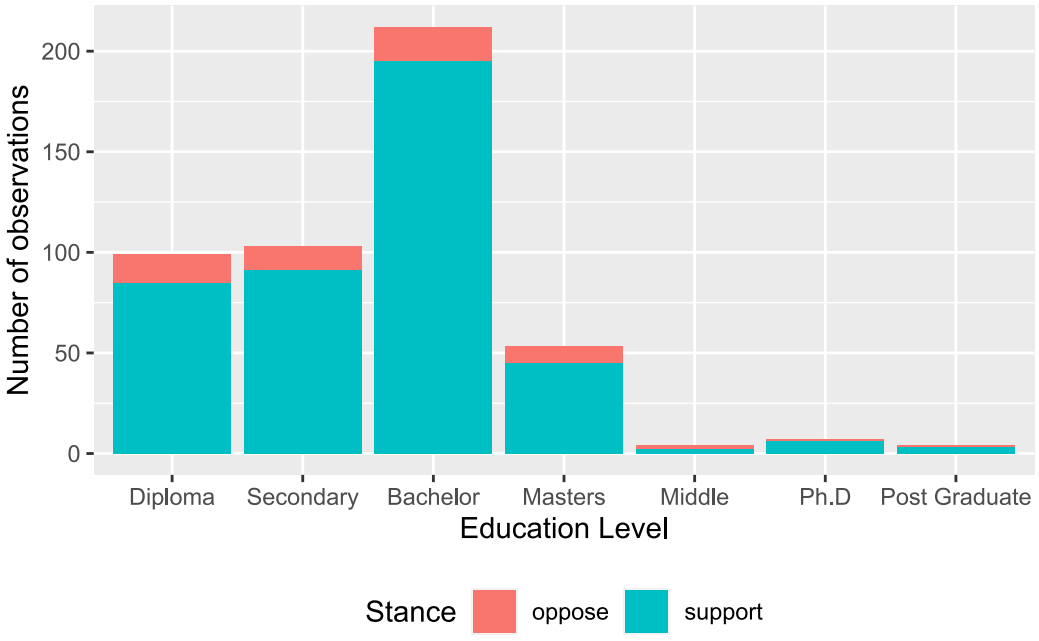
(b): Control

emply_prev	emply_now	n
0	0	164
0	1	1
1	0	3
1	1	12

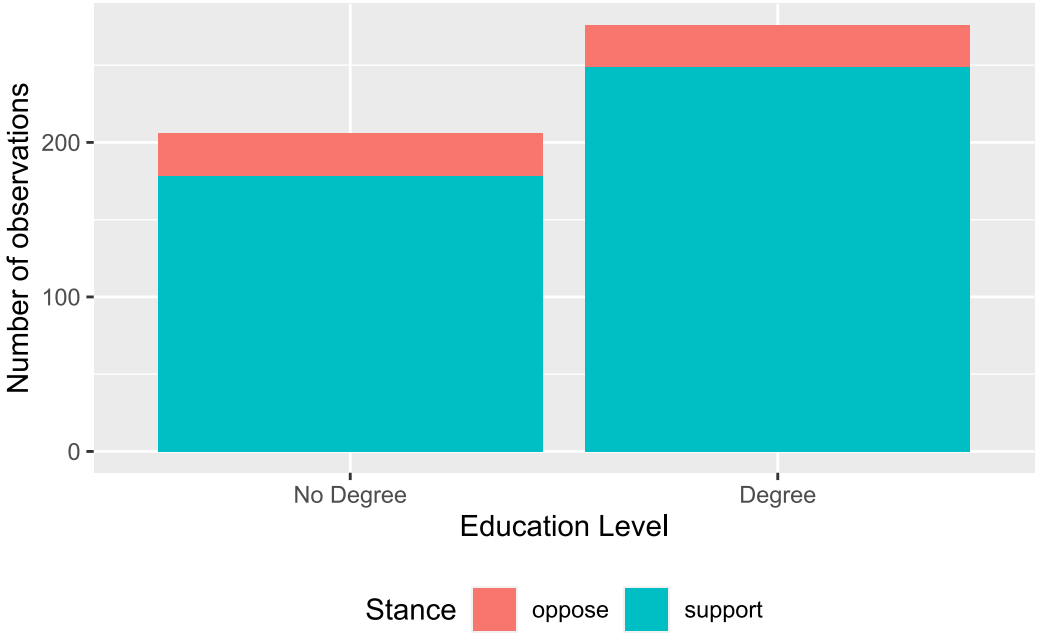
As seen in Table 3, there are slight differences between the treatment and control groups in terms of the participants' wives employment since the first survey. The number of women who moved from not working three months ago to now working is four in the treatment group while only 1 in the control group. The number of women who were employed but is not now is 4 is the treatment group and 3 in the control group. Due to the limited data size of around 350 and the insignificant differences in the changes in employment between the treatment and control group, this Table 3 cannot be decisive evidence in supporting correcting beliefs about others' feelings will affect the outcome of whether the married man's wife works. However, the tables fall more in favour of agreeing than disagreeing.

3.2 Further Analysis

In this section, the analysis will branch off from the original paper and explore the demographics of the men who support/oppose women working outside of home. We will first consider education as a factor that may determine support for WWOH. Research shows that one additional year of education reduces the probability of agreeing with women's traditional gender role [8]. This relationship in the existing data is explored in Figure 3.



(a): Education Levels



(b): With/Without College Degree

Figure 3: Graphs on the Impact that Different levels of Education has on Supporting WWOH

According to Figure 3, the number of people that oppose women working outside of home do decrease with education as Diploma has one of the highest ratio of those that oppose. However, the ratio for Ph.D, and Post graduate are not obvious due to their significantly smaller number

of participants. The next graph combines the participants into two bigger groups for better comparison. In XX, the men are separated into having/not having obtained a college degree as college is a big step in education that can differentiate people's views.

4 Discussion

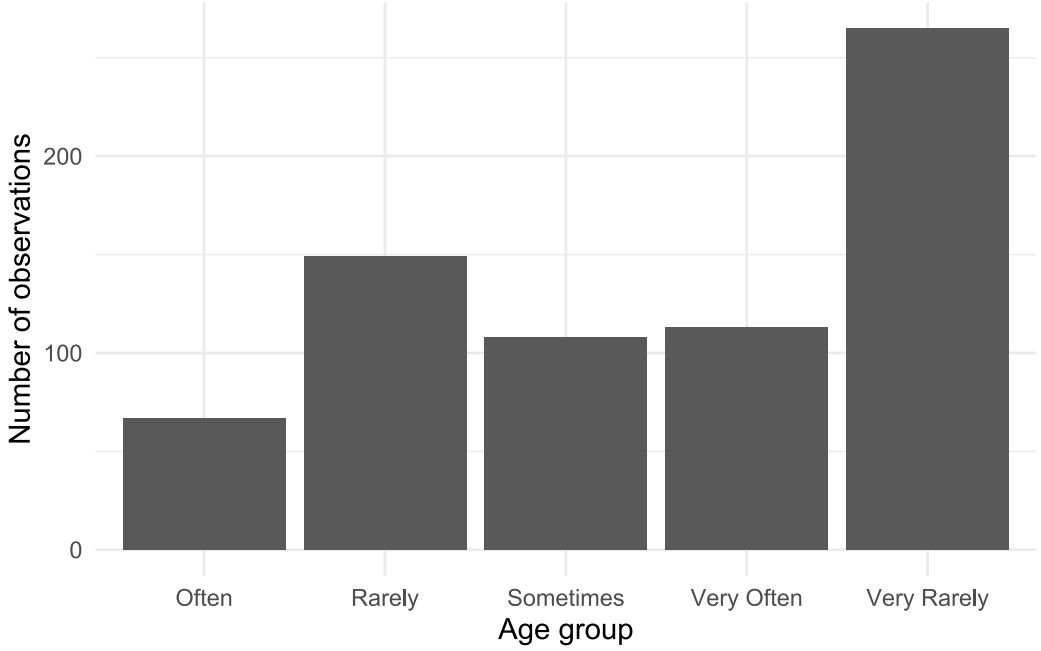


Figure 4: Frequency of WWOH Discussions for Participants in Survey

4.1 Weaknesses and next steps

Weaknesses and next steps should also be included.

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